Human Behavior and the Interior Environment

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This chapter examines the relationship between individuals and their environment—how they perceive space and how they react to it. Perception of one's environment is affected by sociological needs, psychological state, and individual differences. The environment itself also influences human behavior. Both mental and physical stimuli affect behavioral responses. In this chapter material is presented which will help the reader to be more aware of the matters which affect the occupants of a space.

Sociological Human Need

People's perception of their environment influences their social interaction within that environment. Social interaction can be discussed in terms of four concepts: privacy, personal interaction levels, territoriality, and crowding.

Privacy is a central regulatory human process by which persons make themselves more or less accessible to others. In an office environment, privacy may be manipulated through the use of partitions which protect the individual from physical, visual and acoustical intrusion. The plan of an office environment establishes the privacy level at which the office functions.

Definition of an individual's **interaction levels** is one mechanism used in achieving a desired level of privacy. Besides needing enough space to move about and perform various tasks, each person moves within a domain that expands and contracts to meet individual needs and social circumstances. The size of a space determines perceptions, experiences, and uses of that particular environment.

People inherently discern their relationship with others in terms of distances, or spaces, between them. Edward T. Hall defines four distinct distances at which interpersonal transactions normally take place. These are

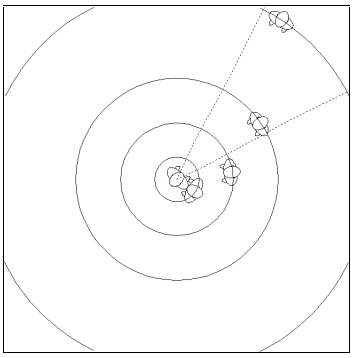

Fig. 1 Levels of space: intimate, personal, social, and public.

categorized as intimate, personal, social, and public[1] (Fig. 1).

- **Intimate space** is that area immediately surrounding the individual's body. This area is the most private and involves both physical and emotional interactions.

- **Personal space** is that area within which a person allows only select friends, or fellow workers with whom personal conversation is mandatory.

- **Social space** is that area within which the individual expects to make purely social contacts on a temporary basis.

- **Public space** is that area within which the individual does not expect to have direct contact with others.

The more intimate the spatial relationship, the more people resist intrusion by others. Personal space factors are important in establishing privacy requirements for interior design.[2]

Territoriality is a means of achieving a desired level of privacy. It involves the exclusive control of a space by an individual or group. This control implies privileges and may involve aggressive actions in its defense. For the individual, territorial control provides security and identity and is communicated through personalization and definition.

Crowding occurs when personal space and territoriality mechanisms function ineffectively, resulting in an excess of undesired external social contact. Sociologically, people respond to crowding in different ways depending upon the situation. Sometimes humans tolerate crowding, though it may be unpleasant, because they know it is only temporary. In some situations crowding may be considered desirable, it may even be sought after if it is perceived as "part of the fun" or the expectation within a social setting. In either situation, however, psychological discomfort may be experienced if the crowding is perceived as too confining.

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[1] Edward T. Hall, The Hidden Dimension (Garden City, NJ: Doubleday & Co., 1990), pp. 122-125.

[2] Hall, pp. 7-10.

Psychological Human Response

Responses to the environment are complex and best understood in terms of three psychological stages of human behavior: perception, cognition, and spatial behavior.

People respond to their environment based upon perception, cognition and spatial behavior.

Perception of the environment, in its most strict sense, refers to the process of becoming aware of a space by the acquisition of information through the sensations of sight, hearing, smell, touch, and taste. **Cognition** is the mental processing of this sensory information. This may involve the activities of thinking about, remembering, or evaluating the information. **Spatial behavior** refers to responses and reactions to the environmental information acquired through perception and cognition.

The designer creates environmental stimuli to direct these psychological stages as well as the secondary processes of motivation, effect and development. **Environmental expectations**, another determining element to be considered by the interior designer, are developed over time through experience and interaction with the environment. Sensations, in combination with expectations of the environment, define one's perception of a space.

Perception and Aesthetic

As stated above, perception of the environment, and consequently the aesthetic appeal of that environment, involves the acquisition of information through our five senses. A person's experience in the environment is very complex. Individual differences such as sex, age and health, to name a few, are important determinants of behavioral responses to an environment. The designer must take into consideration the individuality of various occupants of an environment, their likes, dislikes and personal histories.

Color proves to be an important factor in the perception of an environment's aesthetic. If used carefully and skillfully, it can positively influence mood and behavior. A full range of psychological and emotional effects can be achieved through use of color. Color selection is an integral part of any project design, whether painting

walls, installing floor coverings, upholstering furniture, or selecting art, plants, or graphics.

Perception of the relative size and appearance of a space is often related to color. The following are some generalities to remember about color, human perception and aesthetics. (See Chapters 3 and 4 for additional information.)

Color may be used in various ways to influence our perception of space.

- Certain colors may make a space appear larger than it actually is, while others cause spaces to appear smaller.
- Certain colors may cause a space to seem warm, while others may make it seem cold.
- Colors have a definite effect on the mood of the observer. Some colors are stimulating, others are relaxing.
- Colors that clash with each other may produce feelings of irritation or uneasiness.

Human Response to the Interior Environment

Each person responds uniquely when confronted with a specific situation or experience. These responses fall into three categories—sociological, psychological and physiological—all of which are influenced by factors within the interior environment.

Sociological determinants relate to the social needs and problems of the occupants. Factors that pertain to these sociological responses, including group dynamics and communication, should be considered during planning.

Sociological determinants such as group dynamics and communication affect personal interactions within an environment.

Group dynamics (the interpersonal relationships among members of a small group) are a result of the personality and cultural backgrounds of the individuals involved, their task, and the nature of the physical setting. Spatial arrangements in small groups are functions of environment, task, and personality. Various cultures respond differently to the amount and arrangement of space.

In determining the physical arrangement of an interior space, the interaction distances between work groups and the tasks to be performed are very important to successful communication and social relationships. The

study of small group ecology is important not only from the standpoint of understanding the impact of social relationships, but also from the practical standpoint of designing and maintaining a variety of functional spaces in which various relationships can be fostered.

Studies of **communication** reveal that, in conversation, people prefer to sit across from one another rather than side by side. If the distance between conversing people becomes too great however, they will usually choose to sit side by side rather than across from one another.

The scale of a room—it's size relative to the occupants—also influences conversational distance. As room scale diminishes, people tend to sit closer together. Likewise, increased noise levels and distractions drive people to sit closer together.

Psychological determinants affect an individual's sense of well being in the environment.

Psychological determinants in the planning of an interior environment relate to the psychological needs and concerns of the occupants. Visual privacy, acoustic privacy, and aesthetic factors are key determinants to be considered.

Visual privacy addresses the ability to limit other's view of oneself. Inherent in human behavior is the tendency to avoid situations in which one can be watched without being aware of who is watching. Visual privacy can be achieved through the use of furnishings, partitions or walls. In a private space or an office, people will often orient their desk in order to visually control the doorway and achieve a visually private space on one side of the desk (Fig. 2). Similarly, people prefer to sit with a protected back, controlling the area they cannot see directly. In restaurants, the first seats to be filled are usually those along the walls. In outdoor spaces, people tend to sit against or beside objects such as trees and bushes rather than in the open.

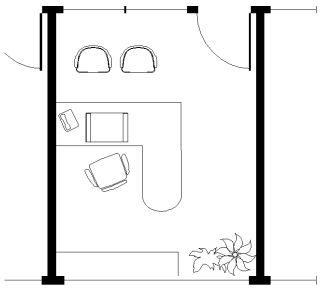

Fig. 2 Visual control is a key to visual privacy

Acoustic privacy in an interior space results from effective treatment of the acoustic environment as an interrelationship of many components: ceiling, partitions, furniture, equipment, and floor. A complete acoustic system will generally provide adequate speech privacy. Speech privacy is achieved when there is sufficient acoustic shielding to allow conversation to be unheard beyond the participants of the conversation. A high quality of speech privacy will contribute

significantly to a desirable level of communication, social interaction, and productivity. An appropriate relationship between background noise and that produced within the activity space is conducive to speech privacy.

Aesthetic appreciation is both expressed in and influenced by the environment. To define aesthetic qualities, the designer needs to understand that the concept of beauty differs with time and place, purpose and context. Values captured under the label "aesthetic" can best be understood at a universally comprehensible level. These aspects of a design go beyond the functional and constructional concerns, and are associated with the specific way the design presents itself to the human senses. The designer uses an object to serve some need or want. When we look at an object, its physical appearance causes a sensory experience in us above and beyond its mere utility. The designer's appreciation of this experience helps him to communicate his intent and understanding to the user.

Physiological determinants relate to physical needs of the occupants. Factors to be considered during the planning phase that deal with physiological responses include functionality, ergonomics, life safety, and health concerns.

Functional efficiency relates to the degree to which physiological needs are supported in the interior space plan. These needs, which are physical in nature, relate to human body requirements. Interior environments must respond to basic human functional needs—vision, hearing, stability, and mobility—to achieve both comfort and efficiency.

Physiological determinants affect our physical comfort in a space.

The ability to comprehend one's environment as well as to perform tasks within it are strongly dependent upon **vision.** The critical variables in human vision are visibility, legibility and recognition. **Hearing** is critical because it not only affects ability to communicate but also the general capacity to perform other tasks. The critical variables in human hearing are audibility, intelligibility, signal-to-noise ratio, and noise annoyance. **Stability** refers to elements that support individuals as they walk and move about or perform functional or manipulative tasks. Some of the elements that need to be

considered in terms of **mobility** include slope of floors, width of walkways, depth of stair treads, location of handrails, and height of door thresholds. All physiological needs affect how a person perceives and reacts to an environment. When these needs are appropriately met, the user will perceive the environment as successful.

Studies show that a worker's productivity increases with an improved environment. Emphasis upon the following specific environmental conditions contribute to improved worker efficiency.

- Proper illumination for each task.
- A suitable acoustic environment that allows ease of communication, limited intrusive noise (and resultant distraction), and protection from ear damage where appropriate.
- Human/facility interface features designed to be used within human mobility and strength limits. (Special attention should be given to the removal of accessibility barriers for the handicapped worker.)

The success of any design depends upon the degree to which it creates an interface between users and the environment.

- Physical features of the facility that are compatible with typical human expectations and comprehension.
- A plan that conserves human energy.
- An environment that allows workers to function within their most productive range of motion.

Ergonomic design recognizes that the environment significantly influences and impacts human behavior. Each aspect of the interior design—including space, furnishings, and environmental variables such as temperature, sound, humidity, and ventilation—needs to be carefully assessed in terms of its compatibility with the purpose for which it is intended: to conform to the human body. The challenge is to plan for the intended activities, furnishings, and finishes that are appropriate for the purpose of the expected user. Ergonomics combines **anthropometrics** (human body measurement data), physiology, and psychology in response to the needs of the user in the environment. This data is used by the designer to create interior designs which are both humanistic and functional in nature.

Life safety and health concerns are primarily focused on human response to negative stimuli; the natural responses when an individual sense danger—generally referred to as fight or flight. Life safety centers on the ability of an individual to vacate a facility in a timely manner when necessary. Generally this is accomplished through an assurance of adequate travel path capacity for the occupants of the space, and a clear indication of a safe means of egress. In a panic or emergency situation, people generally do not have the opportunity to decipher codes which may indicate safe passage at an abstract level. It is imperative that the guide mechanisms be highly visible and clearly stated. Obviously this impacts the designer's desire to control the visual environment as completely as possible. It is therefore in the designer's (as well as the user's) best interest to be aware, from the outset, of the regulatory and common sense criteria that guide the development of egress systems; to work with them to enhance the overall plan, as opposed to applying them at the end over an executed design concept.

Health concerns are often less obvious than life safety. Ergonomic design is an aspect of health consciousness. If a space functions properly for the task, it is less apt to cause physical harm—such as repetitive strain injury (carpal tunnel syndrome) or simple backache. Health concerns also factor into the selection of materials. Fumes from paints or carpet adhesives may cause severe bronchial stress or headaches in some individuals. Often, odors of even non-toxic elements may raise concerns that will foster absence among workers. The designer cannot control all such contaminants, but must be conscious of the range of possible impacts of material selections, and avoid such occurrences when possible.